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EXAMINER

KURR, JASON RICHARD

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/031,120	Applicant(s) NIELSEN ET AL.	
	Examiner Jason R. Kurr	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 8-13 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/16/02 2/7/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 4-7, 10 and 13 are objected to because of the following informalities:

Appropriate correction is required.

Claims 5-7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim may not depend on the multiple dependant claim 3. See MPEP § 608.01(n). Accordingly, the claims 5-7 have not been further treated on the merits.

Claim 4 recites the limitations "the update rate" and "the long term average denominator" in lines 29 and 30. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 depicts "A hearing aid according to claim 8". Claim 8 does not claim a hearing aid. It is unclear to the examiner as to why claim 10 is dependant on claim 8. For the purpose of examining, claim 10 has been viewed as if it were dependant upon claim 9.

Claim 13 refers to the stability detector of claim 12, however claim 13 is dependant on claim 11. It is unclear to the examiner as to why claim 13 is dependant on claim 11. For the purpose of examining, claim 13 has been viewed as if it were dependant upon claim 12.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kalin et al (US 5,661,814).

With respect to claim 1 Kalin discloses a method for canceling feedback in an acoustic system comprising a microphone (fig.1 #1), a signal path (fig.1), a speaker (fig.1 #9), means for detecting presence of feedback between the speaker and the microphone (fig.1 #11) and filter means (fig.1 #15) for compensating at least partly a possible feedback signal, the method comprising:

- using a LMS algorithm for generating filter coefficients (col.1 ln.59-61);
- using a highpass filter to prevent low-frequency signals from entering the LMS algorithm (fig.13 #108, col.11 ln.50-53);
- where an additional feedback cancellation filter (fig.15 #5f) and a noise generator (fig.15 #127) is used for providing low-frequency input for the LMS algorithm (col.13 ln.23-40).

With respect to claim 2 Kalin discloses a method according to claim 1, where a sign-swapping algorithm is used for generating a broad band noise signal, having an

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amplitude substantially equal to the amplitude of the signal from which it was derived (fig.17 #127a, col.13 ln.41-67, col.14 ln.1-12).

With respect to claim 3 Kalin discloses a method according to any of the claims 1 or 2 where a steep low pass filter (fig.16 #133) is used generate a low frequency noise signal to be used as an additional input to the LMS algorithm (col.13 ln.35-40).

With respect to claim 4 Kalin discloses a method according to claim 1, where the LMS algorithm operates with a predetermined essentially level independent adaptation speed when feedback is not present, this representing a first mode,

- where the LMS algorithm operates a level dependant adaptation speed when feedback is present, this representing a second mode;
- where the means for detecting the presence of feedback is used to control the adaptation mode selection of the LMS algorithm;
- where the update rate for the LMS algorithm is determined by the long-term average denominator in the LMS update algorithm in the second mode (col.2 ln.16-22, col.7 ln.62-67, col.8 ln.1-51)

With respect to claim 8 Kalin discloses a method for canceling feedback in an acoustic system comprising a microphone (fig.1 #1), a signal path (fig.1), a speaker (fig.1 #9), means for detecting presence of feedback between the speaker and the

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microphone (fig.1 #11) and filter means (fig.1 #15) for compensating at least partly a possible feedback signal, the method comprising:

- using a LMS algorithm for generating filter coefficients (col.1 ln.59-61);
- using a highpass filter to prevent low-frequency signals from entering the LMS algorithm (fig.13 #108, col.11 ln.50-53).

With respect to claim 9 Kalin discloses a hearing aid comprising:

- a microphone (fig.1 #1);
- a signal path (fig.1);
- an amplifier (fig.1 #5);
- a speaker (fig.1 #9);
- means for detecting feedback between the speaker and the microphone (fig.1 #11);
- filter means for at least partly compensating a possible feedback signal (fig.1 #15);
- memory means including a LMS algorithm for generating filter coefficients (col.1 ln.55-67);
- at least one highpass filter for preventing low-frequency signals from entering the LMS algorithm (fig.13 #108, col.11 ln.50-53).
- An additional feedback cancellation filter (fig.15 #5f) and a noise generator (fig.15 #127) for providing low-frequency input for the LMS algorithm (col.13 ln.23-40).

With respect to claim 10 Kalin discloses a hearing aid according to claim 9, further comprising steep low pass filters (fig.16 #133) for generating a low frequency noise signal to be used as an additional input to the LMS algorithm (col.13 ln.35-40).

With respect to claim 11 Kalin discloses a hearing aid comprising:

- a microphone (fig.1 #1);
- a signal path (fig.1);
- an amplifier (fig.1 #5);
- a speaker (fig.1 #9);
- means for detecting feedback between the speaker and the microphone (fig.1 #11);
- filter means for at least partly compensating a possible feedback signal (fig.1 #15);
- memory means including a LMS algorithm for generating filter coefficients (col.1 ln.55-67);
- where the means for detecting feedback include a bandwidth detecting means (col.8 ln.20-32).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalin et al (US 5,661,814) in view of Yoshida et al (US 5,473,702).

With respect to claim 12, Kalin discloses a hearing aid according to claim 10, however does not disclose expressly wherein the hearing aid comprises a stability detector.

Yoshida discloses an adaptive noise canceller that comprises a stability detector for the signal determined as a feedback signal (fig.10 #331).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the stability detector of Yoshida in the hearing aid of Kalin.

The motivation for doing so would have been to monitor the error in the feedback signal so as to provide for a more accurate correction to the feedback cancellation filter.

With respect to claim 13, Kalin discloses a hearing aid according to claim 12 in view of Yoshida, where the stability detector comprises storage means for a number of values from a number of succeeding time frames and means (Yoshida fig.10 #333) for comparing these (Yoshida col.12 ln.27-37)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Engbretson (US 5,475,759) , (EP App. 0579152 A1).

Engbretson discloses electronic filters for use in hearing aids.

The European Patent Application (0579152 A1) discloses an auditory prosthesis including noise and feedback suppression using adaptive filtering.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-8300. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JK
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XU MEI
PRIMARY EXAMINER